

Appl. No. 09/643,755
Amdt. Dated July 24, 2003
Reply to Office action of March 25, 2003

REMARKS/ARGUMENTS

The Official Action dated March 25, 2003 has been carefully considered. It is believed that the amended specification and the following comments represent a complete response to the Examiner's rejections and place the present application in condition for allowance. Reconsideration is respectfully requested.

Specification

As requested by the Examiner, the specification has been amended in order to delete the phrase "which is incorporated herein by reference in its entirety" on page 1, paragraph 1.

35 U.S.C. §102

The Examiner has objected to claims 1, 3, 5-7, 11 and 13-19 under 35 U.S.C. 102(b) as being anticipated by Willmitzer et al. (WO 92/01042). We respectfully disagree with the Examiner for the reasons that follow.

The Examiner alleges that Willmitzer inherently anticipates the claims as the method of Willmitzer is the same as Applicant's method and therefore the percentage yield of at least 0.5% chymosin would have been an inherent property of Willmitzer. As we have previously stated, Willmitzer is generally concerned with the preparation of enzymes in plants and is not specifically concerned with improved methods for the production of chymosin. Willmitzer describes the expression of various enzymes in various plant parts, including leaves, roots, stems segments and other plant parts. The only enabling disclosure Willmitzer gives with respect to the production of chymosin is using the 35-S CaMV promoter which is a constitutive promoter that results in the expression of chymosin in various plant parts and not directed expression to the seed as is claimed in the present application. Willmitzer only teaches a yield of chymosin of 0.1-0.5% of total soluble protein while the claims of the present application describe a chymosin level of at least 0.5% of the total seed protein which is significantly higher than the levels achieved by Willmitzer. While Willmitzer generally mentions that seed specific

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promoters may be used, it provides no guidance or suggestion to use seed specific promoters in order to increase the yield of chymosin.

There have been numerous decisions on the issue of inherent anticipation in the United States which support Applicant's position in the present case. As an example, we refer to *Crown Operations International, Ltd. v. Solutia Inc.* (2002), (2002), 289 F.3d 1367, wherein the Plaintiff sued the Defendant seeking a declaration that the Defendant's patent was invalid for anticipation. The Defendant's patent related to solar control glass which is composed of two layers of glass with a multi-layer film between the glass layers. An inner layer of the film, known as solar control film, has solar control properties to selectively reflect, absorb or transmit defined percentages of certain wavelengths of light. However, the solar control film tends to wrinkle during manufacture causing visual distortions. The Defendant's patent claims a film that masks the wrinkles from detection by the human eye by limiting to two percent or less the visible light reflection contribution of the solar control film. In their patent, the Defendant stated that "prior automotive windshields have visible light reflection contributions for their solar films of three percent or greater." The Plaintiff contended that a previous patent anticipated the Defendant's patent in every manner but for the 2% visible light reflection. The Plaintiff argued that as the solar glass was identical in every way to the previous patent, the 2% limitation must be an inherent property of Defendant's claimed glass.

The Court of Appeal rejected the Plaintiff's argument and stated:

Regarding alleged anticipation by the Gillery patent, on its face the Gillery patent does not disclose or discuss a two percent limitation for the reflectance contribution of the solar control film. Crown maintains that the '511 patent merely claims a preexisting property inherent in the structure disclosed in the prior art. Crown urges us to accept the proposition that if a prior art reference discloses the same structure as claimed by a patent, the resulting property, in this case, two percent solar control film reflectance, should be assumed. We decline to adopt this approach because this proposition is not in accordance with our cases on inherency. If the two percent reflectance limitation is inherently disclosed by the Gillery patent, it must be necessarily present and a person of ordinary skill in the art would recognize its presence [citations omitted; emphasis added]. Inherency may not be established by probabilities or possibilities. The mere fact

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that a certain thing may result from a given set of circumstances is not sufficient. In arguing inherent disclosure of the two percent limitation in the Gillery patent, Crown bears an evidentiary burden to establish that the limitation was necessarily present.

Therefore, based on the current state of the law, in order for the Examiner to find that Willmitzer inherently anticipates the present claims, either (a) Willmitzer must mention the yield of chymosin as claimed in the present case, which it clearly does not or (b) a person of skill in the art must recognize that Willmitzer would result in a chymosin level of at least 0.5% of the total seed protein. A person skilled in the art would clearly not assume such levels especially since Willmitzer specifically states levels of less than that, i.e. 0.1 to 0.5% of the total soluble protein.

In addition to the *Crown Operations* case discussed above, there have been many other cases with the same conclusion (see e.g. *Continental Can Company USA, Inc. v. Monsanto Company* (1991), 948 F.2d 1264; *In Re Anthony J. Robertson and Charles L. Scripps* (1999), 169 F.3d 743; *Ronald A. Hitzeman v. D.T. Valenzuela* (2001) 243 F.3d 1345; *Mehl/Biophile International Corp. v. Milgraum* (1999), 192 F.3d 1362; *Hughes Aircraft Company v. United States of America* (1988), 15 Cl. Ct. 267). One of the most often quoted cases on the doctrine of inherency is the *Continental Can Company USA, Inc. v. Monsanto Company* (1991), 948 F.2d 1264 wherein the Court stated the law with respect to inherent anticipation:

To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. In *re Oelrich* (1981), 666 F.2d 578 provides:

Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.

We respectfully submit that in the present case the Examiner has not provided any extrinsic evidence establishing that Willmitzer inherently discloses a yield of chymosin of

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at least 0.5% of total seed protein. Therefore, in accordance with the state of the law, Willmitzer can not be said to anticipate the claims.

In view of the foregoing, we respectfully request that the objections to the claims under 35 U.S.C. 102 (b) be withdrawn.

35 U.S.C. §103

The Examiner has objected to claims 1, 3, 5-8, 10, 11 and 13-23 as being unpatentable over Willmitzer et al. either alone or in combination with Applicant's admitted prior art or Adang et al. We respectfully disagree with the Examiner for the reasons that follow.

As stated above, Willmitzer et al. does not disclose the expression of chymosin in seed wherein at least 0.5% of the total seed protein is chymosin. Willmitzer is generally concerned with the preparation of enzymes in plants and is not specifically concerned with the improved methods for the production of chymosin. Willmitzer discloses methods for the expression of various enzymes in various plant parts including leafs, roots, stem segments and other plant parts. Example 1, and prophetic Examples 3 and 4 of Willmitzer teach the expression of chymosin in plant leaves and tubers. The construct employed by Willmitzer in Example 1 involves the use of a 35-S CaMV promoter (i.e. an art recognized strong constitutive promoter) to drive expression. Importantly, using this promoter results in a yield of chymosin of only 0.1-0.5% of the total soluble protein (page 15, line 14). Applicant points out that total soluble protein represents only a fraction of the total protein, namely that fraction of all proteins which is soluble. In contrast the present inventors have unexpectedly found that expression of chymosin can be significantly enhanced or improved by expressing the chymosin in seed using a seed specific promoter. This results in chymosin expression levels exceeding 0.5% of total seed protein. Applicant notes that expression levels exceeding 0.5% of total seed protein are required in order to produce chymosin in plant seeds in a commercially viable fashion.

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Applicant respectfully submits that a person of ordinary skill in the art having considered Willmitzer and desiring to attain improved expression levels of chymosin in plant cells would not find sufficient guidance in Willmitzer to achieve the method of the present invention for the following reasons. Firstly, while Willmitzer may suggest the expression of enzymes in seed, Willmitzer mentions a range of other plant parts including leafs, roots, stems, tubers and other plant parts are equally (if not more) desirable plant parts for expression. Willmitzer provides no guidance or suggestion that preparing chymosin in seed would improve the yield. Thus the Willmitzer disclosure provides no motivation to select seed as a preferring plant part with a reasonable expectation of success (i.e. achieving the desirable significantly improved expression levels). Secondly, while seed-specific promoters are suggested by Willmitzer as one possibility, a person of ordinary skill in the art having read the Willmitzer disclosure would not be compelled to select a seed specific promoter from all possible promoters and expect that chymosin expression would be enhanced. Thirdly, the chymosin expression levels attained by Willmitzer, using a strong constitutive promoter, are substantially lower than those attained by the present inventors. As mentioned previously, Willmitzer only achieves chymosin levels of 0.1% to 0.5% of the total soluble protein. There is nothing in Willmitzer that would lead a person of ordinary skill in the art desiring to attain improved chymosin expression levels to attempt expression of chymosin in plant seed under the control of a seed specific promoter with a reasonable expectation of success of achieving chymosin expression levels in excess of 0.5% of total protein.

In summary, the present inventors have unexpectedly found that expression levels of chymosin in excess of 0.5% of total cellular protein are attainable by expressing chymosin under the control of a seed-specific promoter in plant seeds. The invention is an improvement over Willmitzer as a significant enhancement in chymosin yield is obtained. Willmitzer provides absolutely no guidance or suggestion on how one of skill in the art would improve chymosin production. Therefore Willmitzer cannot be said to render the claims obvious. The deficiencies in Willmitzer are not remedied by Applicant's prior art or by Adang. Prior to the present invention, no one was able to achieve the claimed chymosin levels. Adang is not concerned with methods to improve

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the yield of chymosin in plants by using a seed specific promoter. Therefore one of skill in the art would in no way be motivated by Adang to conduct the method as claimed in the present application.

In view of the foregoing, we respectfully request that the objection to the claims under 35 U.S.C. §103(b) be withdrawn.

The Commissioner is hereby authorized to charge any deficiency in fees (including any claim fees) or credit any overpayment to our Deposit Account No. 02-2095.

In view of the foregoing, we submit that the application is in order for allowance and an early indication to that effect would be greatly appreciated. Should the Examiner like to discuss the matter, she is kindly requested to contact Micheline Gravelle at 416-957-1682 at her convenience.

Respectfully submitted,

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Attachments